

✓ Equilibrium constants in binary systems of methane with other hydrocarbons. Ya. D. Savvin and A. S. Volynskii. *Gazovaya Prom.* 1957, No. 2, 20-30. — The data for vapor-liquid equil., $k = y/x$, of the binary systems of CH₄ with 2,2,3-trimethylbutane, cyclohexane, nonane, benzene,

and toluene of Sage, *et al.* (C.A. 28, 1254¹, 2253¹, 5744¹, 36, 4016¹, 6403¹); Ruhemann (C.A. 33, 5733¹); Boomer and Johnson (C.A. 33, 30¹, 30¹, 1502¹); Benedict and Webb (C.A. 34, 3552¹); Elbishlawi and Spencer (C.A. 45, 10026¹) and of others are recast into uniform plots of k vs. pressure up to the crit. point as isotherms at 20° intervals between 40° and 150°.

— H. L. Quinn —

RM

SAVVINA, Ya.D.

Gas condensate from the Shebelinskoye field and directions for
its refining. Gaz.prom. no.9:6-9 S '57. (MIRA 10:10)
(Gas, Natural)

65-1-4/14

AUTHORS: Velikovskiy, A. S., and Savvina, Ya. D.

TITLE: Condensates from Natural Gas Deposits and their Processing to Light Petroleum Products. (Kondensaty gazokondensatnykh mestorozhdeniy i pererabotka ikh na svetlyye nefteprodukty).

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr.1. pp.17-23. (USSR).

ABSTRACT: In connection with the discovery of deep gas deposits, the new raw material-condensates, which are generally called gas condensates, have gained increasing importance. This gas differs from ordinary gas by containing hydrocarbons with boiling points of 300°C and above. The composition of the gas from various deposits is given in Table 1; methane is the basic component of the gas, 5% of the volume consists of pentane and higher paraffins. Table 2 gives data on the amounts of condensates separated from the gas from various deposits (expressed in cm³/m³ of gas) and their fractional composition. The diagrams in Figs.1 and 2 give phase equilibria of mixtures of methane with n-paraffin hydrocarbons at temperatures of 80°C and 40°C respectively. The Chemical composition of the condensates from various sources is tabulated (Table3). The diagram in Fig.4 gives the gas equilibria of methane with various hydrocarbons at 40°C. Much higher pressures are required

Card 1/2

Concensates from Natural Gas Deposits and their Processing to Light Petroleum Products. ^{65-1-4/14}

to achieve the transition of toluene (in a methane mixture) into the vapour phase, than for benzene (Fig.5). The investigated condensates contain relatively small quantities of sulphur. Condensates from the Ilovinsk Region contain 0.09% sulphur, from the Shebelinsk region - 0.04% sulphur, from Ust'-Vizyuyansk - 0.08% sulphur; no sulphur was found in condensates from the Khodzhiabadsk region. The acidity of the tested condensates varied between 0.3 - 0.7 mg KOH/100 mm. The condensates are either colourless or of a light yellow colour and contained no resinous substances or unsaturated hydrocarbons. Tests showed that the condensates can be processed to industrial products, either by stabilisation or by distillation. The necessary processing equipment consists of a tube furnace, stabilisation and rectification columns, and a heating equipment. It is also possible to include a propane-butane separating plant. Up to 300,000 tons/annum of condensates were obtained from the Shebelinsk and Stepnovsk sources which could be processed to petrol and diesel fuel. It is expected that it will be possible to produce 1,500,000 t of petrol and diesel fuel by 1960. There are 3 Tables, 5 Figures and 15 References: 6 English and 9 Russian.

AVAILABLE: Library of Congress.
Card 2/2

11(2)
 Vsesoyuzny nauchno-issledovatel'skiy institut prirodnuyu gazov
 Razrabotka i eksploataatsiya gazovykh mestonahozhdeniy, transportnaya (Development
 and Exploitation of Gas Fields, Transportation of Gas) Moscow, Gosizdatkhimizdat,
 1999, 353 p. (Series: Itogi nauki i tekhn. Seriya Khimicheskie nauki, Itogi nauki i tekhn.)
 1,500 copies printed.

Sponsoring Agency: Olanovye upravleniye gazovoy promyshlennosti pri Sovetskom
 Ministre SSSR.

Eds.: Ye. M. Minakty and V.N. Raaben; Exec. Ed.: M.P. Maryanova; Tech. Ed.:
 A.S. Polosina.

PURPOSE: This collection of articles is intended for scientists, engineers,
 and technicians associated with the gas industry.

CONTENTS: The articles discuss the development of gas fields, natural gas re-
 covery, reservoir engineering, and subsurface gas conservation. Gas field opera-
 ting conditions are analyzed from the commercial point of view. The author
 notes that due to the specific geological conditions prevailing in the Soviet
 Union the application of gas extraction methods of the type used in the USA
 is not always advantageous. Individual articles discuss problems of the de-
 velopment of gas fields with narrow oil-containing fringes, the theory of gas
 inflow, the study of gas well behavior, gas filtration dynamics, and the
 study of gas condensates. A number of articles are devoted to the study of wa-
 ter stabilized gas flow in pipelines, and discuss theoretical problems connected
 with the performance of gas selectors and compressors. The authors also deal
 with the corrosion of the inner surface of gas pipelines. Conclusions made by
 the authors are supported by mathematical calculations. No personalities are
 mentioned. References accompany each article.

TABLE OF CONTENTS:

Minakty, Ye.M.. Present Status of Gas Field Development	3
Rosenberg, M.D. On the Method of Hydrodynamic Computations Applicable to the Development of Gas Fields With Narrow Oil Containing Reservoir Fringes	34
Rygu, A.G. Flow to Hydrodynamically Imperfect Wells Operating Under Conditions of Expansible Water Pressure in the Formation	73
Korotkoy, Yu.P. On the Method of Obtaining and Interpreting Results of Gas Well Investigations Carried out Under Stabilized Filtration Conditions	84
Korotkoy, Yu.P. Laboratory Study of the Operation of a Gas Well Containing Liquid at the Bottom Hole	112
Korotkoy, Yu.P. and S.M. Tverlyykin. Measuring Pressure and Temperature in a Gas Well Shaft	125
Budakov, B.N. Gas Leakage in a Horizontal Water-containing Formation During Subsurface Gas Conservation	132
Rygu, A.G. and S.M. Rygu. Experimental Study of Segregation Processes of Gas-water Mixtures in Pore Environments	141
Savvin, Ya.D. Condensates of the Condensed Gas Reservoirs in the USSR	172
Tubkilev, V.Y. and Ye.D. Savvin. Analysis of the Composition of the Formation Gas in Condensate Gas Reservoir	196
Tubkilev, V.Y. Methods of Studying Condensed Gas Systems	197

VELIKOVSKIY, A.S., SAVVINA, Ya. D., YUSHKIN, V.V., KHUDYAKOV, O.F.

Studying the potential of the Leningrad gas-condensate field.
Gaz.prom 5 no.23-8 F '60. (MIRA 13:6)
(Kuban--Condensate oil wells)

VELIKOVSKIY, A.S.; SAVVINA, Ya.D.

Use of low temperature separation when paraffin is present in the
condensate. Gaz.prom. 6 no.2:5-7 '61. (MIRA 14:4)

(Condensate oil wells)

VEILKOVSKIY, A.S.; YUSHKIN, V.V.; KHUDYAKOV, O.F.; SAVVINA, Ya.D.

Concise data on some gas-condensate fields of the Soviet Union.
Trudy VNIIGAZ no.17:58-65 '62. (MIRA 15:12)
(Condensate oil wells)

SAVVINA, Ya.D.

Experimental importance of the constants of equilibrium in hydrocarbons
in some binary mixtures. Trudy VNIIGAZ no.17:185-196 '62. (MIRA 15:12)
(Chemical equilibrium) (Hydrocarbons)

SAVVINA, Ya.D.

Effect of pressure and temperature on the solubility in the gas
of hydrocarbons forming condensates. Trudy VNIIGAZ no.17:209-214
162. (M RA 15:12)

(Hydrocarbons) (Condensate oil wells)

VELIKOVSKIY, A.S.; YUSHKIN, V.V.; KHUDYAKOV, O.F.; SAVVINA, Ya.D.; STEPANOVA, G.S.

Methods for studying gas-condensate fields. Trudy VNIIGAZ no.17:11-32
'62. (MIRA 15:12)

(Condensate oil wells)

SAVVINA, Ya.D.

Special conditions governing the separation of a condensate containing
paraffin from gas in the process of low-temperature separation. Trudy
VNIIGAZ no.17:135-141 '62. (MIRA 15:12)

(Krasnodar Territory—Gas, Natural—Separation)
(Paraffin wax)

SAVVINA, Ya.D.; VELIKOVSKIY, A.S.

Effect of the structure of hydrocarbons on their behavior in binary
systems with methane. Trudy VNIIGAZ no.17:163-184 '62. (MIRA 15:12)
(Hydrocarbons) (Methane)

SAVVINA, Ya.D.; VELIKOVSKIY, A.S.

Phase equilibria in triple hydrocarbon systems. Trudy VNIIGAZ no.17:
197-202 '62. (MIRA 15:12)
(Hydrocarbons) (Chemical equilibrium)

VELIKOVSKIY, A.S.; SAVVINA, Ya.D.

Constant factors in the composition of condensates. Trudy VNIIGAZ
no.17:270-278 '62. (MIRA 15:12)

(Condensate oil wells)

SAVVINA, Ya.D.; SHUKLINA, L.D.

Aromatic and six-membered naphthene hydrocarbons contained in the
fraction boiling between 59-150° from the Maikop condensate. Trudy
VNIIGAZ no.17:279-284 '62. (MIRA 15:12)
(Hydrocarbons) (Condensate oil wells)

SAVVINA, Ya.D.

Condensates from the gas condensate pools of the Russkiy Khutor
field. Gaz. delo no.9:15-19 '63. (MIRA 17:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut prirodnogo gaza.

VELIKOVSKIY, A.S.; SAVVINA, Ya.D.

Condensate gases as a raw material for the chemical industry.
Khim i tekhn. topl. i masel 9 no.5:1-6 5 My'64 (MIRA 17:7)

YUSHKIN, V.V.; SAVVINA, Ya.D.

Estimating the reserves of stable condensate and its recovery
factor. Gaz. prom. 9 no.7:7-11 '64. (MIRA 17:8)

KHODYAKOV, O.F.; SAVVINA, Ya.D.; KARLINSKIY, Ye.D.

Testing wells of the Punignskoye field for condensate. Gaz. prom.
9 no.7:11-15 '64. (MIRA 17:8)

SAVVINA, Ya.D.; YUSHKIN, V.V.

Investigating the Glinskoye-Rozbishevka field for gas condensate.
Neft. i gaz. prom. no.2:44-47 Ap-Je '64. (MIRA 17:9)

YUSHKIN, V.V.; SAVVINA, Ya.D.

Glebovo gas-condensate field. Neft. i gaz. prom. no.4:41-43
O-D '64 (MIRA 18+2)

ACCESSION NR: AP5015459

UR/0318/64/000/008/0010/0012

AUTHOR: Velikovskiy, A. S.; Savvina, Ya. D.

TITLE: Condensates from gas-condensate fields as sulfur-free raw materials for catalytic processes

SOURCE: Nefteprodukty i neftokhimiya, no. 8, 1964, 10-12

TOPIC TAGS: catalysis, hydrocarbon, gas fuel

Abstract: Increased sulfur content in hydrocarbon catalytic raw materials reduces the activity and stability of catalysts. However, within the Soviet Union, numerous gas-condensate fields (containing hydrocarbons from isopentane up to those boiling at 200-500°C) have been found, and the raw material proved to be remarkably free from sulfur. The article presents data about the composition of condensates from 18 fields in various parts of the USSR and discusses the use of these raw materials for further catalytic processing. Orig. art. has 1 table.

ASSOCIATION: VNIIGaz

SUBMITTED: 00
NO REF SOV: 005

ENCL: 00
OTHER: 000

SUB CODE: FP, GC
JPRS

Card 1/1

YUSHKIN, V.V.; SAVVINA, Ya.D.

Nature of the producing horizons of the Russkiy Khutor Central
gas field. Gaz. delo no.9:3-9 '64. (MIRA 17:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut prirodnoy gaza.

SAVVINA, Ya.D.

Condensates of new gas condensate fields. Gaz. delo no.10:7-9
'65. (MIRA 18:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut prirodnogo
gaza. Submitted March 20, 1965.

VELIKOVSKIY, A.S.; SAVCHENKO, V.P.; SAVVINA, Ya.D.; YUSHKIN, V.V.;
ZYKIN, M.Ya.

Prediction of the petroleum fringe in a gas condensate layer
based on the composition of formation gas. Gaz. prom. 10
no.9:1-6 '65. (MIRA 18:11)

BALALAYEV, G.A., inzh., red.; SAVVINA, Yu.A., kand. tekhn. nauk, red.;

[Instructions for planning anticorrosive protection of structural elements of industrial buildings producing aggressive media] Ukazaniia po proektirovaniu antikorrozionnoi zashchity stroitel'nykh konstrukttsii promyshlennykh zdaniy v proizvodstvakh s agressivnymi sredami (SN 262-63). Moskva, Stroiizdat, 1964. 89 p. (MIRA 17:8)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva. 2. Gosstroy SSSR (for Balalayev). 3. Nauchno-issledovatel'skiy institut betona i zhelezobetona Gosstroya SSSR (for Savvina).

SAVVINA, Yu.A.; SERB-SERBINA, N.N.

Properties of concrete hardening at low temperatures. Stroil.prom.
32 no.9:6-9 S '54. (MIRA 7:11)
(Concrete--Testing)

Savvina, Yu. A.

MTI ✓ Physicochemical investigations of water impermeability of cement. N. I. SEMEN-SKABINA AND YU. A. SAVVINA. *Tsement*, 21 (2) 3-8 (1988).—The reaction of chlorides was studied chiefly with C_3A and also with C_2S . Above $0^\circ C$, C_2S and $CaCl_2$ form mostly $CaOCl_2$; below 0° , Ca hydroaluminates are formed chiefly. C_3A and $CaCl_2$ form Ca hydroaluminates above and below 0° . These compounds are stable with time and slightly soluble in water and in $CaCl_2$ solutions. In solution of sulfates and $CaCl_2$ there is the simultaneous formation of sulfo- and chloro-hydroaluminates of Ca . Addition of $NaCl$ to the mixing water does not result in new hydrate formation of complexes. Water permeability decreased when concentrated solution of $CaCl_2$ was used for mixing the cement; the decrease started during the initial stage of its structure formation. B.Z.K.

SAVVINA, Yu. A.

✓ Influence of hydrochloroaluminate compounds on strength and life of concrete. Yu. A. Savvina and N. N. Serb-Serbina. *Stroitel'-Prom.* 39, No. 9, 31-6 (1956). While the type of cement used for pouring concrete below its f.p. is immaterial, the optimum addns. of CaCl_2 and NaCl permitting this practice depend on the mineralogical compn. of the cement and on the setting conditions. For high-aluminate cements it is best to use NaCl alone, or a soln. of CaCl_2 - NaCl in the ratio not higher than 1:4. For medium-aluminate stock this ratio should be close to 1:1 and the total concn. below 22%. For low-aluminate cements variations from 1:1 to 4:1 are permissible depending on the

total salt concn. For the 1:1 ratio up to 26-7% salts can be used, for the 4:1 not more than 22%. These conclusions are supported by diagrams of CaCl_2 absorption by $3\text{CaO} \cdot \text{Al}_2\text{O}_3$ under different conditions. Hydration of $3\text{CaO} \cdot \text{Al}_2\text{O}_3$ in CaCl_2 soln. forms $3\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 3\text{CaCl}_2 \cdot 30\text{H}_2\text{O}$ (I) and $3\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{CaCl}_2 \cdot 10\text{H}_2\text{O}$. Their formation during the plastic state of setting causes chem. dispersion leading to a uniform structure and better properties. Formation of I during crystn. stage increases the vol. of the solid phase and leads to higher internal stresses. Addn. of NaCl acts as a regulator of I formation reducing both hydration velocity and the amts. of CaCl_2 and H_2O absorbed.

I. D. Gat

meth

pm

2 1/8 10M

228

SAVVINA, Yu. A.

SERB-SERBINA, N.N.; SAVVINA, Yu.A.; ZHURINA, V.S.

Formation of calcium hydrochloro-aluminates and its action
on the structure of hardened cement. Dokl. AN SSSR 111 no.3:
659-662 N '56. (MLRA 10:2)

1. Institut fizicheskoy khimii Akademii nauk SSSR. Predstavleno
akademikom P.A. Rebinderom.
(Calcium chloride) (Portland cement)

LEYRIKH, V.E.; ANTONOVA, I.T.; SAVVINA, Yu.A.; FISKINA, R.Ya.; BRODSKIY,
G.S.

Properties of concrete containing an admixture of furyl-aniline
resin. Plast.massy no.10:38-42 '60. (MIRA 13:12)
(Concrete)

L5328

S/191/63/000/002/012/019
B101/B186

12,6000

AUTHORS: Savvina, Yu. A., Leyrikh, V. E.
TITLE: Concretes with admixtures of highly elastic polymers
PERIODICAL: Plasticheskiye massy, no. 2, 1963, 42-46

TEXT: The effect of admixtures to concrete of alkali-resistant ABXB-70 (DVKhB-70) latex "etilinit" suspension, or aqueous suspensions of polyvinyl acetate was investigated. Vibration-rolled concrete specimens were prepared with DVKhB-70 latex at a water/cement rate of 0.5-0.55; the specimens were mixed with 1, 1.5, or 2% polymer referring to the cement weight. They were tested for compressive and tensile strength after 7, 28, and 90 days. After 90 days the concrete without polymer had a compressive strength of 334 and a tensile strength of 26 kg/cm²; with 2% latex, the values were 318 and 33, respectively. The R_{tens}/R_{compr} ratio rose from 0.08 to 0.11. For vibration-rolled mortars, the ratio rose from 0.08 to 0.16. Concretion was delayed but adhesion of the concrete to the reinforcement was improved. 1-5% "etilinit" suspension.

Card 1/2

Concretes with admixtures of ...

S/191/63/000/002/012/019
B101/B186

did not affect tensile and compressive strength but lowered the elastic modulus by $1/3$. Both "etilinit" and DVKhB-70 made the concrete impermeable to petroleum products and gasoline. Addition of polyvinyl acetate plastified the concrete. 25% polyvinyl acetate, referring to the water, increased the bending strength after 90 days from 28 to 90 kg/cm², the R_b/R_{compr} ratio was 0.42. Creeping occurred after months of bending. ✓

1-5% polyvinyl acetate did not increase the bending strength but reduced the compressive strength so that the R_b/R_{compr} ratio rose from 0.12 to

0.17. Conclusion: the demands likely to be made on structures and future stresses in them must be considered when adding polymer admixtures to concrete. There are 2 figures and 6 tables.

Card 2/2

L 45197- 65 EWG(s)-2/EWP(j)/EWT(m) Pc-4/Pw-4 RM
 ACCESSION NR: AP5014971

UR/0228/64/000/007/005/006

AUTHOR: Antonova, I. T. (Engineer); Savvina Yu. A. (Candidate of technical sciences);
 Leyrikh, V. E. (Candidate of technical sciences) 23
 8

TITLE: Polymer-cement concrete with additives of furfuryl alcohol and aniline hydrochloride

SOURCE: Stroitel'nyye materialy, no. 7, 1964, 5-6

TOPIC TAGS: concrete. polymer. cement

Abstract: Polymer-cement concrete with additives of furfuryl alcohol and aniline hydrochloride possesses increased durability in petroleum media and mineral oils. It is characterized also by increased impact strength, bending and tensile strength, elasticity, adhesion to ordinary concrete, and low water permeability. These properties recommend its use in the printing industry, in plants manufacturing alcohol, and as seamless covering for floors. Gasoline- and oil-resistant mixtures are given. The tensile strength, tenacity, coefficient of tenacity, frost-resistant properties, thermophysical indexes (heat capacity, coefficient of thermal conductivity, and coefficient of thermal expansion), shrinkage, elastic properties, deformation limits, water permeability, and other properties of this concrete are also listed. Orig. art. has 2 tables.

Card 1/2

L 45197-65

ACCESSION NR: AP5014971

ASSOCIATION: none

SUBMITTED: .00

ENCL: 00

SUB CODE: MT

NO REF SOV: 000

OTHER: 000

JPRS

Card

2/2

ORG: Institute of Semiconductor Physics, Siberian Department, AN SSSR, Novosibirsk
(Institut fiziki poluprovodnikov Sibirskogo otdeleniya AN SSSR)

SOURCE CODE: UR/0288/66/000/003/0118/0124

TITLE: Influence of the linear electro-optic effect on second-harmonic generation in ADP crystals

SOURCE: AN SSSR. Sibirskoye otdeleniye. Izvestiya. Seriya tekhnicheskikh nauk, no. 3, 1966, 118-124

TOPIC TAGS: ADP crystal, second harmonic generation, electrooptic effect, *crystal optic property, electric field, laser beam, ruby laser*

ABSTRACT: Theoretical and experimental investigations were made of the variation $\Delta\psi_0$ affecting the phase-matching angle ψ_0 for second harmonic generation (SHG) in an ADP crystal whose optical characteristics are modified by an applied electric field. It was found that only the component E_z of the field along the optical axis has an appreciable effect on the angle ψ_0 . This effect is at its maximum when the plane of the laser beam in the crystal and the optical axis is at 45° to the transverse crystal axes. Then, $\Delta\psi_0 = 54.04 (10^{-6}) E_z$, where E_z is in Kv/cm and $\Delta\psi_0$ is in radians. From this it follows that a field of 100 Kv/cm causes an 18' variation

JM]

SUB CODE: 20/ SUBM UDC: 548.0:535

L 02955-67 ENT(1)/EEC(K)-2/T/ENT(K) IJP(c) WG
ACC NR: AP6032930 SOURCE CODE: UR/0288/66/000/002/0155/0156

AUTHOR: Krivoshchekov, G. V.; Kirin, Yu. M.; Marennikov, S. I. Savvinykh, G. A.;
Dotsenko, V. I.

ORG: Institute of Semiconductor Physics, Siberian Department AN SSSR, Novosibirsk
(Institut fiziki poluprovodnikov Sibirskogo otdeleniya AN SSSR)

TITLE: A method of laser frequency conversion

SOURCE: AN SSSR. Sibirskoye otdeleniye. Seriya tekhnicheskikh nauk, no. 2, 1966,
155-156

TOPIC TAGS: laser, ruby laser, laser output frequency, laser frequency variation,
laser emission

ABSTRACT: A method is described for converting the output frequency of a laser by using the Raman lines of the beam in benzene and its subsequent mixing in an ADP crystal. The arrangement consists of a Q-switched ruby laser (the output beam of which is passed through a vessel with benzene), the mixing crystal, a filter of aqueous solution of CuSO_4 (for suppression of the main frequency of the laser at $\lambda = 6943 \text{ \AA}$), and a PGS-2 spectrograph with photographic recording. The intensity of Raman lines ($\lambda = 6494, 7459, \text{ and } 8059 \text{ \AA}$) is sufficient to effect a nonlinear interaction of all frequencies within the 2-mm thick mixing crystal. The emissions at 3471 and 3729 $\text{\AA}$ can be considered second harmonics or the results of the mixing of corresponding frequencies, while those at 3596 and 3874 $\text{\AA}$ are the results of mixing

Card 1/2

UDC: 621.378.329

ACC NR: AP6032930

only. The intensity of these lines can be explained by a large divergence of the focused beam, which insures that the conditions of synchronism are fulfilled for all frequencies. The experiments show that by employing Raman scattering in various substances with subsequent nonlinear transformation in an ADP-type crystal, a coherent output beam can be obtained at any frequency within the optical range. Orig. art. has: 2 figures and 2 tables.

SUB CODE: 20/ SUBM DATE: 23Feb65/ ORIG REF: 005/ OTH REF: 003/ ATD PRESS: 5099

Cord 2/2

L 44011-66 EWT(1)/EWP(e)/EWT(m) YI/EWP(t)/EII/EWP(k) LKIC 100 2490/2492
 ACC NR: AP6026717 SOURCE CODE: UR 0181/66/008/008/2490/2492

AUTHOR: Bondarenko, A. N.; Kirovoshchekov, G. V.; Marennikov, S. I.; Pestryakov, Ye. V.; Savvinikh, G. A.

ORG: Institute of Physics of Semiconductors, SO AN SSSR, Novosibirsk (Institut fiziki poluprovodnikov SO AN SSSR)

TITLE: Excitation of ultrasonic oscillations in crystals under the effect of a ruby/laser beam

SOURCE: Fizika tverdogo tela, v. 8, no. 8, 1966, 2490-2492

TOPIC TAGS: ruby laser, laser emission, ultrasonic oscillation, KDP crystal, nonlinear optics

ABSTRACT: The authors describe briefly the conditions for the excitation of ultrasonic oscillations in a KH_2PO_4 crystal by the emission of a ruby laser. The crystal was 15 x 15 x 4.8 mm along the x, y, and z axes, respectively. Several experiments were performed to clarify the excitation mechanism of these oscillations. A design of the experimental set-up used is described and shown (Fig. 1). The Q-switched laser beam (rotating prism) (~ 10 Mw), passing through the glass plate (b) and lens (c1) with a focal length $F=210$ mm, falls on the crystal (d) fixed on a revolving stand between two lead foil electrodes. A part of the emission, reflected from the plate (b),

Card 1/3

L 44011-56
ACC NR: AP6026717

densities. The effect of electrostriction appears small. The results of the experiment show that in order to determine the power of laser emission it is sufficient to measure the initial amplitude of the crystal oscillations, which is independent of the degree of focusing the laser beam on the surface of a piezocrystal covered with a (0.03 mm) lead foil with a high-reflectivity factor. In conclusion, the authors express their gratitude to V. N. Ishchenko, N. D. Lizunov, and M. L. Baybakov for useful discussions and for assistance in the experiments. Orig. art. has: 2 figures. [26]

SUB CODE: 20/ SUBM DATE: 17Feb66/ OTH REF: 001 ATO PRESS 5070

Card 3/3 LC

ACC NR: AP6026717

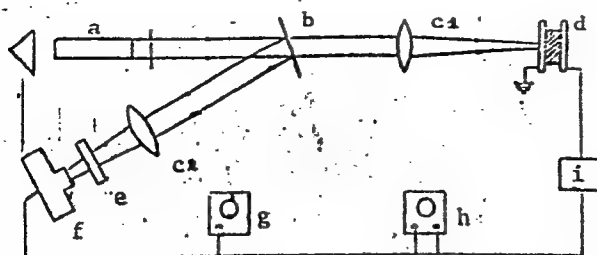


Fig. 1. Diagram of the experimental set-up

passes through the lens (c2) and several filters (e) and falls on the photomultiplier FEU-22 (f), the signal from which then starts the oscillograph (h) (C1-8), recording the emf from the electrodes. The level of laser oscillation was controlled by the oscillograph (g) (C1-4); the signal was amplified by the amplifier. Ultrasonic oscillations were also recorded when ADP, quartz, and PbZrTiO_3 crystals were irradiated with a ruby laser beam. The crystal oscillation amplitude decreased with an increase in laser radiation density at the free crystal surface. This change is possibly associated with increased signal attenuation due to local (at the focus) heating of a crystal or with a decrease in the absorption coefficient at higher laser radiation

Card 2/3

Case
SAVVINYKH, S.K.: Master Phys-Math Sci (diss) -- "On the theory of equations
of state of crystals". Tomsk, 1958. 11 pp, (Tomsk State U im V.V. Kuybyshev),
160 copies (KL, No 1, 1959, 113)

SAVVINYKH, G.A.; SAVVINYKH, S.K.

Vibration spectra of ideal crystals. Izv. vys. ucheb. zav.; Fiz.
no.1:106-112 '58. (MIRA 11:6)

1.Sibirskiy fiziko-tekhnicheskii institut pri Tomskom gosuniversitete
imeni V.V. Kuybysheva.
(Crystallography, Mathematical)

AUTHOR: Savvinykh, S. K.

SOV/126-6-3-3/32

TITLE: On the Thermodynamics of Ideal Crystals (K termodinamike ideal'nykh kristallov)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 3, pp 400-411 (USSR)

ABSTRACT: Up to the present time in the majority of papers concerned with the thermodynamics of crystals, vibrations of the crystal lattice were discussed in terms of approximate models introduced many years ago by Debye and others. In the Debye approximation the vibration of the crystal is treated as the vibration of an elastic continuum. According to the model due to Gruneisen, particles in the crystal vibrate independently of each other. In the determination of the frequency of vibrations, each atom is assumed to move in the field of the remaining atoms, fixed in positions of static equilibrium. These approximations have not been entirely successful. Salter (Ref.1) gives a method which can be used to express thermodynamic functions directly in terms of the elements of

Card 1/4

On the Thermodynamics of Ideal Crystals

SOV/126-6-3-3/32

the dispersion matrix of the crystal. However, Salter's results are strictly applicable only in the high temperature region. It is shown in the present paper that Salter's method may be used to derive more general formulae which are applicable to both the low and the high temperature region. The expressions obtained for thermodynamic functions are used in a discussion of the equations of state and the specific heats of crystalline argon. As a comparison, this problem is also discussed in terms of the Debye and Gruneison approximations. It is shown that the free energy of the crystal may be expressed in the form of Eq.(1.7) which consists of two parts. The first part involves the total contribution of all the frequencies of the spectrum to the free energy and is described by means of an effective frequency ω_{eff} . The second part is an extra term which enables us to judge to what extent the thermodynamic behaviour of the system of identical non-interacting oscillators with a frequency ω_{eff} differs from the behaviour of the crystal. Cases are possible when, in thermodynamic quantities, the first term involving the effective frequency will be much greater than the second term in the wide interval of

Card 2/4

On the Thermodynamics of Ideal Crystals

SOV/126-6-3-3/32

changes in macroscopic parameters. This explains why the single frequency approximation leads to good results. As an example, the case of solid argon is discussed. Results of calculations of isotherms are shown in Fig.1. The following conclusions can be made from these calculations:

1) Zero order vibrations of atoms lead to an additional "expansion" of the crystal; 2) The critical volume v_k

(v_k is the volume corresponding to the minimum of an iso-

therm) decreases as the temperature increases; 3) The absolute magnitude of the critical pressure $p_k = p(v_k)$

increases slowly at first as the temperature increases and then more rapidly and follows in a wide temperature interval an almost linear law. It is shown that very similar results are obtained by the Debye and Gruneisen methods. Next, the specific heat of argon is considered and the results of calculation of the specific heat at constant volume are shown in Fig.3. At higher temperatures (above 40°K, say) results

Card 3/4

On the Thermodynamics of Ideal Crystals

SOV/126-6-3-3/32

coincide with those obtained from the Gruneisen approximation but at lower temperatures they differ (and the values are higher) from both the Gruneisen and Debye approximations. The results of calculation of the specific heat at constant pressure are shown in Fig.4. The latter results are compared with experiment (Ref.8). At higher temperatures the theoretical data are all higher than experimental results. This is due to the fact that anharmonic vibrations have not been taken into account. This is confirmed by Henkel's work, who showed that if anharmonicity is taken into account even in the Gruneisen method, good agreement with experiment is obtained. There are 4 figures, 1 table and 9 references, 2 of which are Soviet, 3 German and 1 Swiss.

ASSOCIATION: Tomskiy gosudarstvennyy universitet, Zapadno-Sibirskiy filial AN SSSR (Tomsk State University ; the West Siberian Branch of the Academy of Sciences, USSR)

SUBMITTED: January 4, 1957.

1. Crystals--Thermodynamic properties
2. Crystals--Vibration
3. Crystals--Lattices
4. Crystals--Mathematical analysis

Card 4/4

SOV/56-34-5-32/61

AUTHORS: Pokrovskiy, V. L., Savvinykh, S. K., Ulinich, F. R.

TITLE: Superbarrier Reflection in Quasi-Classical Approximation
(Nadbar'yernoye otrazheniye v kvaziklassicheskom priblizhenii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
Vol. 34, Nr 5, pp. 1272 - 1277 (USSR)

ABSTRACT: The purpose of this paper is the determination of an asymptotical expression for the coefficients of reflection in the case of short wave lengths. The authors restrict themselves to the one-dimensional case. The problem is represented by the solution of the Schroedinger (Shredinger) equation:

$$\alpha^2 \frac{d^2 \psi}{d\xi^2} + k^2(\xi) \psi = 0$$

where $\alpha = \lambda/a$; $\xi = x/a$; $k^2(\xi) = 1 - U(\xi)/E$ holds. λ denotes the De Broglie (De Broyl') wave length of the free particle. The main assumption is $\alpha \ll 1$. The authors everywhere restrict themselves to the case $E > U(\xi)$ on the whole ξ -axis.

Card 1/3

Superbarrier Reflection in Quasi-Classical Approximation SOV/56-34-5-32/61

The solution of this Schroedinger equation is determined by the usual WKP (Wentzel-Kramers-Brillouin) method in the form $\psi = e^{S/\alpha}$, and S is expanded into a series according to powers of α . In the WKP approximation the quantum effect of the reflection in a potential barrier is completely missing. Therefore an other method must be employed for the determination of the reflected wave. By means of the transformation

$\psi = y/\sqrt{k}$ the first mentioned equation takes the form $(d^2y/dt^2) + (1 + \alpha^2 q(\alpha t))y = 0$. To this equation the operation of the scattering in a continuous spectrum is formally applied. All terms of the scattering series have the same order with regard to α . The problem is the computation of the amplitude of the transition from the eigenstate of the Hamiltonian

$H_0 = d^2/dt^2$ with the momentum 1 to the state with the momentum -1. This amplitude is expressed by a well-known series from perturbation theory. Subsequently the terms occurring in this expression are examined separately. The process of computation is pursued step by step. In the case of

Card 2/3

Superbarrier Reflection in Quasi-Classical Approximation SOV/56-34-5-32/61

an arbitrary form of the potential for the main part of the reflection coefficient

$$R = -ie^{2i\tau_0/\alpha} = -i \exp\left\{\frac{2i}{\alpha} \int_0^{\infty} kd\right\} \quad \text{is found.}$$

The last paragraph investigates the limits of applicability of this formula. The authors investigated the restrictions of the domain of the parameters. There are 5 references, 4 of which are Soviet.

ASSOCIATION: Institut radiofiziki i elektroniki Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Radiophysics and Electronics at the Siberian Department of the AS USSR)

SUBMITTED: December 14, 1957 (initially), January 26, 1958 (after revision)

1. Wave analysis--Theory
2. Perturbation theory--Theory
3. Mathematics--Theory

Card 3/3

SOV/56-34-6-33/51

AUTHORS: Fokrovskiy, V. L., Ulinich, F. R., Savvinykh, S. K.

TITLE: The Superbarrier Reflection in Quasiclassical Approximation. II
(Nadbar'yernoye otrazheniye v kvaziklassicheskom priblizhenii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
Vol. 34, Nr 6, pp. 1629-1631 (USSR)

ABSTRACT: This paper obtains an asymptotic expression for the amplitude of the superbarrier reflection under the conditions $k_0 a \gg 1$ and $k_0 a(E - U_0)/U_0 \gg 1$. The denotations used in this paper were explained already in part I of this investigation (Ref 1). The form of this expression essentially depends on the type of the singularity of the potential. This paper investigates only two important special cases: the poles of the first and second order. The reflection amplitude is expanded into a series. L. I. Shiff (Ref 3) and D. S. Saxon (Sakson) (Ref 4) investigated the potential scattering of particles with high energies in the three-dimensional case under the conditions $\kappa/\alpha \approx 1$, $\alpha \ll 1$. According to the results of this paper the method of the above mentioned authors cannot be applied to

Card 1/2

SOV/56-34-6-33/51

The Superbarrier Reflection in Quasiclassical Approximation. II

the scattering into large angles. Their results are equal to the results of this paper only for small κ/c , that is, in the region where the perturbation theory can be applied. There are 4 references, 2 of which are Soviet.

ASSOCIATION: Institut radiofiziki i elektroniki (Institute of Radio Physics and Electronics) Sibirskiy filial Akademii nauk SSSR (Siberian Branch, AS USSR)

SUBMITTED: January 31, 1958

Card 2/2

AUTHORS: Pokrovskiy, V., Ulinich, F., Savvinykh, S. ^{K.} SOV/20-120-3-18/67

TITLE: Local Reflection in Wave Guides of Variable Cross Section
(Lokal'noye otrazheniye v volnovodakh peremennogo secheniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 3,
pp. 504 - 506 (USSR)

ABSTRACT: This paper investigates the local reflection and the scattering of the following type: Scattering and reflection are caused by local "defects" of the shape of the wave guide (i.e. by angles, discontinuities of curvature, etc.) The cross sections of the wave guides are assumed as being constant at the ends, and they are further assumed to change slowly within the transition range. The authors, for reasons of greater simplicity, explain the method applied to the case of a plane wave guide with variable cross section. The z-axis is assumed to be directed along the wave guide, and the field strength is not assumed to be dependent on the coordinate x. The method used here is a combination of the methods developed by Wentzel (Venttsel')-Kramers-Brillouin (Brillyuen) (WBK-method) and the usual perturbational method. The equation of zero-th approximation and an ansatz for its approxi-

Card 1/3

Local Reflection in Wave Guides of Variable Cross
Section

SOV/20-120-3-18/67

mation are written down. In zero-th approximation the individual waves pass through the wave guide without any scattering or reflection. The calculation process is outlined. The results obtained show that the effects produced by reflection and scattering depend essentially on the smoothness of their connecting seam. The method developed here may easily be generalized for wave guides having similar cross sections, and it may also be used in the case of existing points of rotation (punkt povorota).

ASSOCIATION: Institut radiofiziki i elektroniki Zapadno-Sibirskogo filiala Akademii nauk SSSR (Institute of Radiophysics and Electronics, West-Siberian Branch, AS USSR)
PRESENTED: February 12, 1958, by M.A. Leontovich, Member, Academy of Sciences, USSR
SUBMITTED: February 8, 1958

Card 2/3

Local Reflection in Wave Guides of Variable Cross
Section

SOV/20-120-3-18/67

1. Waveguides--Performance

Card 3/3

SOV/109-59-4-2-2/27
AUTHORS: Pokrovskiy, V.L., Ulinich, F.R., and Savvinykh, S.K.
TITLE: The Theory of Waveguides of Variable Cross-Section
(K teorii volnovodov peremennogo secheniya)
PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 2,
pp 161-171 (USSR)
ABSTRACT: The article considers the propagation of the electro-
magnetic waves in "plane" metallic waveguides of
variable cross-section, without taking into account the
loss in the walls. It is assumed that at very large
distances the cross-sections of the waveguide are
constant, though they may be different at various ends
of the system. It is also assumed that the walls of
the guide are inclined to the axis at a comparatively
small angle. The problems of this type were investigated
by a number of authors (Ref.1, 2 and 3) who employed
the method of the eigen functions of plane diaphragms.
This method has a number of disadvantages and, therefore,
the aim of this work was to find a more satisfactory
method. For the purpose of analysis, it is assumed that
the waveguide is excited at its left-hand side terminal

Card 1/5

SOV/109-59-4-2-2/27

The theory of waveguides of Variable Cross-Section

and that its cross-section increases monotonically. The axis of the waveguide is z and the fields are dependent on co-ordinates y and z . The boundaries of the waveguide are determined by:

$$y = \pm f(\alpha z) \quad (1)$$

where α is a small parameter. New co-ordinates η and ξ are introduced so that the lines $\eta = \pm 1$ coincide with the boundaries of the waveguide while the lines $\xi = \text{const}$ are orthogonal to the lines $\eta = \text{const}$. Therefore, y can be written as Eq (2) while the lines orthogonal to $\eta = \text{const}$ are given by Eq (3). The parameter C of Eq (3) is expressed in terms of ξ by Eq (4). From Eq (3) and Eq (4), ξ is expressed by Eq (5). The inverse transformation can be done by means of Eq (6) which are accurate to within α^2 . The Laplacian in η and ξ co-ordinates is in the form of Eq (9). The electromagnetic field can be expressed by a vector-potential $\vec{A}$ which satisfies Eq (10) and Eq (11) and the boundary conditions expressed by Eq (12). The field vectors can be found from Eq (13). The waves of the electric type

Card 2/5

SOV/109-59-4-2-2/27

The theory of Waveguides of Variable Cross-Section

can be determined from Eq (15) where U is a scalar potential given by Eq (16). Similarly, the waves of the magnetic type can be found from Eq (17). If a new variable $\xi = \alpha \zeta$ is introduced, the operators L_0 and L_1 (see Eq (9)) are expressed by Eq (19). By employing the Wentzel-Kramers-Brillouin method (Ref 4) and the perturbation method, an expression in the form of Eq (20) is obtained, where β is a small parameter. This equation should satisfy the boundary conditions expressed by Eq (16) or Eq (18). The solution of the equation is in the form of Eq (21) so that Eq (20) leads to Eq (22). The zero approximation U_0 of Eq (21) is in the form of Eq (23). The amplitudes U_{n0} of Eq (23) can be found from Eq (24). The solution of this is given by Eq (26). For very large ξ , Eq (26) can be expressed by Eq (27). The function of the first approximation U_1 is given by Eq (29). The expressions for U_{n1} can be found from Eq (30) or Eq (34). The solution of these is in the form of Eq (35). For very large ξ , Eq (35) is either in the form of Eq (36) or Eq (37). The integrals in Eq (36) or

Carl 3/5

SOV/109-59-4-2-2/27

The Theory of Waveguides of Variable Cross-Section

Eq (37) are in the form of the function given by Eq (38) and can be expanded into a power series of α . If only one wave having an index 1 propagates from the left-hand side terminal of the waveguide, the transmission coefficient D_1 , the reflection coefficient R_1 and the scatter coefficient S_{1n} are expressed by Eq (46). The formulae derived above are employed to analyse two special cases. If the waveguide is such that each boundary consists of three flat planes so that the function $f(\xi)$ is given by Eq (47), the reflection coefficient is expressed by Eq (48), while the scatter coefficient is given by Eq (50). For a waveguide whose boundaries are determined by the function defined by Eq (51), the reflection and the scatter coefficients are expressed by Eq (52). The above analysis shows that only the changes of the phase are substantially dependent on the form of the waveguide. On the other hand, the amplitudes are primarily determined by the "irregularities" of the waveguide junctions. The authors express their

Card 4/5

SOV/109-59-4-2-2/27

The Theory of Waveguides of Variable Cross-Section

gratitude to Yu.B.Rumer, V.A.Toponogov and A.I.Yel'kind
for valuable discussion. There is an appendix and
4 references of which 2 are Soviet and 2 English.

SUBMITTED: 20th July 1957

Card 5/5

AUTHOR: Savvinykh, S.K.

SOV/109-4-6-9/27

TITLE: Theory of Circular Waveguides of Variable Cross-section
(K teorii volnovodov peremennogo krugovogo secheniya)

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 6,
pp 972 - 979 (USSR)

ABSTRACT: The boundary of the waveguide is formed by rotation of a curve $y = f(az)$ around the axis z . The function f is a positive monotonically increasing function and a is a small parameter. In order to investigate the system in a set of "natural" co-ordinates (Pokrovskiy et al - Ref 1), it is possible to employ the co-ordinate grid of a plane system. The new co-ordinates ζ, η, φ are related to the cylindrical co-ordinates z, r, ψ in the following manner (Ref 1):

Card 1/4

SOV/109-4-6-9/27

Theory of Circular Waveguides of Variable Cross-section

$$z = \xi - \frac{\alpha \eta^2}{2} f'(\alpha \xi) f(\alpha \xi) + O(\alpha^3)$$

$$r = \eta f(\alpha \xi) \left\{ 1 - \frac{\alpha^2 \eta^2}{2} [f'(\alpha \xi)]^2 \right\} + O(\alpha^4) \quad (1)$$

$$\psi = \varphi$$

The boundary of the waveguide in the new co-ordinates is given by $\eta = 1$. Further, in Eqs (1) it is sufficient to consider only the first two terms of the expansion. The Lamé coefficients corresponding to the new co-ordinates are given by Eqs (2). The fields E and H can be determined from Eq (3). This, when expressed in the new co-ordinates, is in the form of Eq (4), where $\hat{L}$ is an operator. The zero approximation to the electrical field E_0 can be expressed by the Borgnis functions. The waves of the electrical type are given by Eq (8), where U can be found from Eq (9). On the other hand, for the waves of the

Card2/4

SOV/109-4-6-9/27

The Theory of Circular Waveguides of Variable Cross-section

magnetic type, the electric field components are given by Eq (10). If Eq (9) is solved, the electrical waves can be expressed by Eqs (11), while the magnetic waves are given by Eqs (12). The functions z_{mn} in Eqs (11) and

(12) are the solutions of Eq (13), where the parameters Q_{mn} are defined by Eqs (14) and (15). The final

expression for z_{mn} is given by Eq (17). The first approximation to the solution of the field can be found from Eq (20). The solution can be expressed as a Green tensor and is given by Eq (21). The tensor can be formed from functions Φ_e and Φ_h which are defined by Eqs (22). The subscripts m, n in Eqs (22) denote the indices m, n and k . The components of the Green tensor are related to the components of the function

Φ by Eq (24). The waves of the electrical type can now be found from Eq (25) and those of the magnetic type from Eq (26). The solution of Eq (25) shows that the electric

Card3/4 wave is given by Eq (27), where various parameters are

SOV/109-4-6-9/27

The Theory of Circular Waveguides of Variable Cross-section

defined by Eqs (28) and (29). On the other hand, the wave of the magnetic type is given by Eq (30), where some of the parameters are defined by Eqs (31) and (32); the remaining parameters in Eqs (27) - (32) are defined by Eqs (33) and (34). The author expresses his gratitude to V.L. Pokrovskiy for some valuable advice. There 4 references, 3 of which are Soviet and 1 English. 1 of the Soviet references is translated from English.

SUBMITTED: March 6, 1958

Card 4/4

24(5),9(9)

AUTHORS: Pokrovskiy, V., Ulinich, F.,
Savvinikh, S.

SOV/20-124-2-17/71

TITLE: The Non-Local Reflection in Hollow Conductors of Variable
Cross Sections (Nelokal'noye otrazheniye v volnovodakh
peremennogo secheniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 2, pp 304-306
(USSR)

ABSTRACT: In a previous report the reflection and scattering of waves on
the local defects of the shape of the hollow conductor was
investigated. The present paper deals with the non-local
reflection and scattering which are caused by the nonregularity
of the shape of the hollow conductor as a whole. For reasons of
simplicity plane hollow conductors are investigated. The authors
determine the potential U in form of a series of successive
approximations. In zero-th approximation the equation

$$\frac{1}{f} \frac{d}{df} \left(f \frac{dU_{on}}{df} \right) + k_n^2(f) U_{on} = 0, \quad k_n^2 = k^2 - \frac{\lambda_n^2}{f^2}$$

Card 1/3

is obtained.

The Non-Local Reflection in
Hollow Conductors of Variable Cross Sections

SOV/20-124-2-17/71

The system of denotation is the same as in the aforementioned previous paper. When solving this equation it is necessary to take not only the passing-through but also the reflected wave into account. The amplitude of the reflected wave is an exponentially small quantity of the type $e^{-A/\alpha}$ ($A > 0$). For the case under investigation the amplitudes of reflection were determined already by some earlier papers. The equation of first approximation corresponding to the special case under investigation is written down; its solution is found by means of Green's function $G_n(\xi, \xi')$. The course of the calculation is followed step by step. In conclusion, the contribution made by the irregular shape of the hollow conductor to the amplitude of the reflected wave and also the interference terms are estimated. Calculations of the amplitude of the backwards scattered wave can be carried out in a similar manner.

Card 2/3

The Non-Local Reflection in
Hollow Conductors of Variable Cross Sections

SOV/20-124-2-17/71

According to the results obtained by the calculations discussed here, higher approximations make a contribution of a higher order with respect to α than the zero-th and the first approximation. There is 1 Soviet reference.

ASSOCIATION: Institut radiofiziki i elektroniki Sibirskogo otdeleniya
Akademii nauk SSSR (Institute for Radiophysics and Electronics
of the Siberian Department of the Academy of Sciences, USSR)

PRESENTED: September 25, 1958, by M. A. Leontovich, Academician

SUBMITTED: September 24, 1958

Card 3/3

9.1300

77207
SOV/109-5-1-20/20

AUTHOR: Savvinykh, S. K.

TITLE: Letter to the Editor. On the Subject of the Article
"On the Theory of Waveguides of Variable Circular
Cross Section"

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 1, p 176
(USSR)

ABSTRACT: The author admits some errors in his article, "On
the Theory of Waveguides of Variable Circular Cross
Section," published in Radiotekhnika i elektronika,
1959, Vol 4, Nr 6. He gives the correct expressions
re-establishing the symmetry of coefficients connected
with waves of magnetic and electric types. The author
withdraws his objections to the method of membrane
functions developed by B. Z. Katsenelenbaum.

Card 1/1

L 5408-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2/T/EWA(h) IJP(c) AT

ACC NR: AP5027392

SOURCE CODE: UR/0181/65/007/011/3194/3199

AUTHOR: ^{44.55} Savvinykh, S. K.; ^{44.55} Karpushin, A. A.; ^{44.55} Klyachko, B. S. ⁶⁰
⁵¹
^B

ORG: ^{44.55} Institute of Physics of Semiconductors, SO AN SSSR, Novosibirsk (Institut fiziki poluprovodnikov SO AN SSSR)

TITLE: Interaction between an elastic surface wave and a semi-infinite plasma ^{31.44.55}

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3194-3199

TOPIC TAGS: semiconductor theory, piezoelectric crystal, surface wave

ABSTRACT: Attenuation due to interaction between a piezoelectric field and the free carriers in a semiconductor ^{31.44.55} is calculated for an elastic wave traveling along a piezoelectric-semiconductor interface for two simple surface models: the "mirror" interface and the diffuse interface. It is assumed that the plane $z = 0$ is the interface between a piezoelectric crystal and a semiconductor with no piezoelectric properties filling the space $z > 0$, that the semiconductor has a single type of carrier with rms dispersion and is non-degenerate, and that both the semiconductor and piezoelectric crystal are elastically isotropic, the piezoelectric crystal be-

Card 1/2

09011316

L 5408-66

ACC NR: AP5027392

longing to the cubic class T (or T_d) whose piezoelectric tensor is expressed in terms of a single constant

$$\beta_{x, yz} = \beta_{z, xy} = \beta_{y, xz} = \beta_{x, yz} = \beta_{z, xy} = \beta_{y, xz} = \beta,$$

while all components with coincident indices are equal to zero. It is further assumed that the piezoelectric effect is weak. Two cases are considered: 1. the piezoelectric crystal fills the entire semispace; and 2. the piezoelectric crystal occupies a layer of thickness h . The authors are sincerely grateful to E. G.

Batyev, A. P. Kazantsev and V. L. Pokrovskiy for discussing the work. Orig. art. has: 28 formulas. 44,55 44,55

SUB CODE: SS/

SUBM DATE: 17Apr65/

ORIG REF: 004/

OTH REF: 000

BVK

Card 2/2

SAVON, S. M.

USSR/Chemistry of High-Molecular Substances, F

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61705

Author: Tsytetkov, V. N., Savvon, S. M.

Institution: None

Title: Dynamic Double Refraction in Solutions of Fractions of High-Molecular Polystyrene

Original

Periodical: Zh. tekhn. fiziki, 1956, 26, No 2, 348-358

Abstract: By means of the universal dynamo-optimeter an investigation was made of dynamic double refraction of solutions of polystyrene (I) fractions, in benzene, over the molecular weight M interval from one to $5 \cdot 10^6$. The results thus obtained are in full agreement with the previously secured data (Referat Zhur - Khimiya, 1956, 16288) relating to toluene solutions of I having lower M . Characteristic values (with zero gradients and concentrations) of angles of orientation and double refraction increase monotonously with M of the samples in quantitative agreement with the orientation theory of Maxwell's effect.

Card 1/1

TSVETKOV, V.N.; BYCHKOVA, V.Ye.; SAVVON, S.M.; NEKRASOV, I.K.

Intramolecular interaction and segment anisotropy of chain molecules
in solution. Vysokom. soed. 1 no.9:1407-1415 S. '59.
(MIRA 13:3)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR i Leningradskiy
gosudarstvennyy universitet im. A.A. Zhdanova.
(Macromolecular compounds) (Propene) (Styrene)

DAVYDOV, I.V.; SAVVOV, V.P.

Experimental determination of stresses in ropes. Gidrotekhnika no.1:
96-98 '61. (MIRA 15:3)

(Rope--Testing)

DAVYDOV, I.V.; SAVVOV, V.P.

Laboratory studies of stresses arising in mooring structures as a ship
is being loaded. Gidrotekhnika no.2:127-129 '62. (MIRA 16:5)
(Ship models) (Cargo handling)

SAVVUSHKIN, V.A., mashinist teplovoza.

Work practice of diesel locomotive engineer V.A. Savvushkin. Elek. 1
tapl. tiaga 2 no.8:40-41 Ag '58. (MIRA 11:9)

1. Depo Petropavlovsk, Omskaya doroga.
(Diesel locomotives)

SAVVUSHKIN, V.A., mashinist teplovoza

Advice suggested by practice. Elek.i tepl.tiaga 5 no.11:19
N '61. (MIRA 14:11)

1. Depo Petropavlovsk Yuzhno-Ural'skoy dorogi.
(Diesel locomotives--Maintenance and repair)

SAVVUSHKIN, Ye. S.

SAVVUSHKIN, Ye. S., Cand Tech Sci -- (diss) "Study of the law of distribution of contact pressure in the compression of a short brushing to the shaft." Mos, 1958. 13 pp (Min of Higher Education USSR, Mos Automech Inst). 130 copies (KL, 20-58,98)

SAVVUSHKIN, Ye.S., inzh.

Distribution of contact stresses in the hubs of wheels and axles
during press-fitting. Vest. TSHII MPS 17 no.1:49-53 F '58.
(Car wheels) (Car axles) (MIRA 11:3)

ROZHDOV, V.A.; SAVVUSHKIN, Ya.S., kand.tekhn.nauk; CHUYKO, P.A.

Lateral stability of semitrailers. Avt.prom. 29 no.1:9-11
Ja '63. (MIRA 16:1)

(Truck trailers)

NEUSTROYEV, Sergey Semenovich [deceased]; MIL'KOV, F.N., prof., doktor
geograf.nauk; SAVYANOVA, Ye., red.; KLYUCHKIN, Ya., tekhn.red.

[Natural regions in Orenburg Province; a geographical sketch]
Estestvennye raiony Orenburgskoi gubernii; geograficheskii
echerk. Chkalov, Chkalovskoe izd-vo, 1950. 132 p. (MIRA 13:6)

(Orenburg Province--Physical geography)

SAVVUSHKIN, Ye.S., kand.tekhn.nauk; KURYLEV, V.F.

Natural vibrations in the longitudinal plane of the tractor-
semitrailer system. Avt.prom. 29 no.9:14-15 S '63. (MIRA 16:9)
(Tractor trains--Vibration)

SAVYCH, D. M.

TABLE I SOME REVISIONS

807/870

Amol'son, I. M., V. G. Kozlov, V. V. Kiselev, O. I. Mikhomov, Ye. N. Pavlov,
O. M. Savich, D. M. Savich, V. D. Tomashuk, A. M. Dvornik

Discussion paper: Chemical Industry of the USSR (Kyiv,
Verkh. Vydav. 1960, 12-17 (1961), 128 p., 2,000 copies printed.
(Series: Chemical Industry of the USSR in perspective v. 1961)

M. I. A. I. Kuznetsov, Ed. (Izdat. Khim. 1961, 128 p., 2,000 copies printed.)

REMARKS: This book is intended for the general reader interested in the development
of the chemical industry of the USSR.

COMMENT: The authors discuss the present development of several important branches
of the chemical industry. The text is illustrated with many photographs
of equipment and installations. No personalities are mentioned. There are no
references.

One copy

SAVYCHEV, M.Ya.; BORODKINA, L.A.; red.

[Collective farm fertilizer plant; practices of the
"Pamiat' Lenina" Collective Farm in Khotynets District,
Orlov Province] Kolhoznaia fabrika udobrenii; opyt
kolkhoza "Pamiat' Lenina" Khotynetskogo raiona Orlovskoi
oblasti. Moskva, Rossel'khozizdat, 1965. 33 p.
(MIRA 18:10)

SAVITSKIY, I. V.

SAVITSKIY, I. V.

S/058/63/000/003/073/104
A059/A101

AUTHORS: Pashkovs'kyy, M. V., Savyts'kyy, I. V., Zelenyuk, V. K.

TITLE: Influence of the conditions of preparation on the electric properties of mercuric sulfide

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1963, 71, abstract 3E493
("Visnyk L'vivs'k. un-tu. Ser. fiz.", 1962, no. 1(8), 90 - 96, Ukrainian)

TEXT: The electric properties of α -HgS obtained by different methods and also the influence of some impurities on the properties of HgS are studied. The polycrystalline HgS samples were prepared by the cold-pressing method of powders obtained in the chemical way or by the reaction of Hg with S in vacuo. The latter technique yield samples of higher purity. In a flask, 160 to 170 mm long and 22 to 28 mm in diameter, 150 g of pure HgS can be prepared in one cycle (15 to 20 hours). Aquadag, In or Sn contacts were used. The temperature dependence of the electric conductance (σ) was examined in the temperature range from liquid nitrogen to 500°C. The anomalous temperature course of σ in the first heating

Card 1/2

Influence of the conditions of...

S/058/63/000/003/073/104
A059/A101

cycle, and also the phenomena of polarization and depolarization related by the authors to the heterogeneity of the samples, ionic conductivity, and surface phenomena, were recorded. A Cu impurity increases, while Cd, Al, Se, and I impurities decrease the electric conductivity of α -HgS. The width of the forbidden band of α -HgS determined from the temperature course of σ is equal to 1.8 e. Single-crystal samples of α -HgS were prepared by reacting S with Hg in an evacuated flask at 560 - 570°C. Their electric properties are analogous to the properties of the polycrystalline samples, but no polarization is observed in single crystals, though a region of space charge was observed in them by an electro-optical method when current was passed.

Yu. Tkhonik

[Abstracter's note: Complete translation]

Card 2/2

KONORSKIY, B., prof.; SAVYUK, V., inzh. (Krayova, Rumyniya); CHAKI, F.,
kand. tekhn. nauk (Budapesht, Vengriya); GRESHNYAKOV, V.M., inzh.;
MODEROV, A.A., inzh.; SAPOZHNIKOV, R.A., doktor tekhn. nauk, prof.;
SAPERSHTEYN, N.D., kand. fiz.-mat. nauk; BOGATYREV, O.M., kand.
tekhn. nauk (Moscow).

Modification of the Heaviside formula. Elektrichestvo no.3:86-88
Mr '58. (MIRA 11:5)

1. Lodzinskiy politekhnicheskiy institut, Pol'sha (for Konorskiy).
2. Leningradskiy politekhnicheskiy institut imeni Kalinina (for
Greshnyakov, Moderov). 3. Leningradskiy voyenno-mekhanicheskiy
institut (for Sapozhnikov, Sapershteyn).
(Electric engineering)

8(3)

AUTHOR:

Savyuk, V., Engineer (Roumania, Iasi)

SOV/105-59-6-18/28

TITLE:

External Reactances of Steel Conductors and Bus Bars
(Vneshniye reaktivnyye soprotivleniya stal'nykh provodov i shin)

PERIODICAL:

Elektrichestvo, 1959, Nr 6, pp 78-80 (USSR)

ABSTRACT:

The calculation of the magnetic field of steel conductors is a nonlinear problem. As an exact calculation is very difficult, simplifications must be introduced, which must be justified both from a physical and a practical point of view. One of the methods for the calculation of the external reactance of sufficiently long and parallel cylindrical lines is based upon the application of the functions of a complex variable. This could be the magnetic permeability of steel, which is by many times greater than that of air and hence can be assumed as infinite. The external perimeter of the rail cross-section can then be regarded as a line of force of the magnetic field. Formulas (1) and (2) are derived for the external reactances for a horizontal and a vertical position of the rail, and formulas (3) and (4) for conductors with a small cross-section and formula (5) for isosceles angle irons. The formulas for

Card 1/3

External Reactances of Steel Conductors and Bus Bars

SOV/105-59-6-18/28

conductors with a circular cross-section are the most convenient. In this case the radius of the equivalent round conductor must be determined, proceeding from formula (6) (the magnetic fields on the surface must be equal). The center of the equivalent conductor must be placed in the center of gravity of the perimeter of the real conductor. The method presented has been checked experimentally. The results of the comparison of the experimental and the calculated data are given in figure 3 and 4. The following has been found: 1) for thin rails formulas (3), (4) and (5) which have been derived under the assumption of a uniform current distribution in the rail and ignoring its thickness, give a better agreement with experimental experience than the other formulas. 2) The influence of the near-range effect upon the reactance of steel conductors is negligible. 3) Formulas (4) and (11) in the reference 5 give great deviations, if the distance between the conductors is small. 4) For vertical bus bars formula (2) gives too low values as compared to experiment, the thinner the rails are. 5) The method of an equivalent round conductor gives great deviations, if the distance between the conductors is small; for large distances, however, the experimental and calculated values

Card 2/3

External Reactances of Steel Conductors and Bus Bars

SOV/105-59-6-18/28

show a good agreement (with the exception of the case, where rails with a rectangular cross-section are in an upright position). There are 4 figures and 7 references, 6 of which are Soviet.

SUBMITTED: December 26, 1957

Card 3/3

8(3)

AUTHORS:

Savyuk, V., Engineer, Geteciarm, Chi.
Engineer (Romania, Iasi)

SOV/105-59-7-13/30

TITLE:

Effective Resistances and Internal Reactances of Steel Conduction Lines in the Case of Mechanical Load (Aktivnyye i vnutrenniye reaktivnyye soprotivleniya stal'nykh provodov pri mekhanicheskoy nagruzke)

PERIODICAL:

Elektrichestvo, 1959, Nr 7, pp 52.- 54 (USSR).

ABSTRACT:

The results obtained by experiments are given in which the effective resistances and the internal reactances of steel conduction lines at loads below the elastic limit were investigated, and in which the influence of the cyclic character of the load was taken into account. 6 conduction lines of different diameters, different chemical composition, and subjected to different thermal treatments were investigated. Measurements were carried out by means of the compensation scheme (Ref 4) at an industry frequency of 50 cycles and an invariable external temperature. The mechanical loads were produced by means of weights. With a decrease of mechanical load, a deviation of the electrical characteristics from the original was observed. In order further to investigate this phenomenon, various samples of the same conduction line were

Card 1/3

Effective Resistances and Internal Reactances of Steel
Conduction Lines in the Case of Mechanical Load

SOV/105-59-7-13/30

subjected to a cyclic load. The data obtained show that in each of the successive load cycles, the effective resistance and the internal reactance of the line becomes greater compared to the preceding cycle. After a relatively small number of cycles, the increase of resistances stops. The diagrams obtained and shown by figure 5 show that with an increase of the mechanical load, the effective resistance and the internal reactance become smaller with increasing diameter of the conduction line. These resistances decrease very considerably in annealed lines, less in the case of hardened lines, and still less in lines that have not been thermally treated. The following was found on the basis of the investigations carried out: If the conduction lines are subjected to a variable load while in operation, it is necessary that in manuals and form-sheets the effective resistance and internal reactance of the conduction lines exposed to the action of repeated mechanical loads are given. These conditions must include also the coefficients β_r and β_x of the variation of line resistances given in mm^2/kg . The highest values of β_r and β_x correspond to the annealed, the lower ones to the hardened, and the lowest to the

Card 2/3

Effective Resistances and Internal Reactances of Steel
Conduction Lines in the Case of Mechanical Load

SOV/105-59-7-13/30

lines that have not previously been subjected to any thermal treatment. These coefficients become greater, the greater the diameter, and the fewer impurities the iron contains. There are 5 figures, 1 table, and 5 references, 4 of which are Soviet.

SUBMITTED: December 26, 1957

Card 3/3

SAVYUK, V.G., inzh.; STRASHINSKIY, I.D., inzh.

New suspended reciprocating feeders. Gor.zhur. no.8:54-55
Ag '62. (MIRA 15:8)

1. Permskiy zavod gornoshakhtnogo mashinostroyeniya.
(Mining machinery)

SAVZDARG, E., prof.

Nematode garden pests. Zashch. rast. ot vred. i bol. 10
no.7:49-50 '65. (MIRA 18:10)

1. Moskovskaya ordena Lenina sel'skokhozyaystvennaya akademiya
im. Timiryazeva.

SAVZDARG, E. E. (Co-author)

See: YATSYNINA, K. N.

SAVZDARG, E. E. "On the Use of Lime-sulfur Preparations in the Control of Scab of Fruit Trees," Bolezni Rastenii, Vestnik Otdela Fitopatologii Glavnogo Botanicheskogo Sada SSSR, vol. 19, no. 3-4, 1930, pp. 123-148. 464.8 Z6

So: Sira - Si - 90 - 53, 15 December 1953

SAVEDARG, E. E. (Co-author)

See: TROFIMOVICH, A. Ya.

SAVZDARG, E. E. Protection of Crops from Pests and Diseases,
Publishing House of Tsk VLKSM (Central Committee of the All
Union Lenin's Young Communist League), "The Youth Guard", Moscow,
1947, 71 pp. 464.4 Sa9

So: Sira - Si - 90 - 53, 15 December 1953

SAVZDARG, E. E.

SAVZDARG, E. E. Protection of Crops from Pests and Diseases,
Publishing House of Tsk VLKSM (Central Committee of the All
Union Lenin's Young Communist League), "The Youth Guard,"
Moscow, 1950, 68 pp. 464. Sa9

So: Sira - Si - 90 - 53, 15 December 1953

1. SAVZDARG, E. E., TROFIMOVICH, A. Ya
2. USSR (600)
7. Bor'ba s vreditelyami i boleznymi sel'skokhozyaystvennykh kul'tur. (Uchebn. Posobiye. Pererabot. i Popolneno Primenitel'no k Usloviyam Moldav. SSR) (Combatting the Pests and Diseases of Agricultural Crops. (A Training Manual. Revised and Supplemented for Application to Moldavian SSR Conditions)), 83 pp, Kishinev, 1951.
9. Mikrobiologiya, Vol XXI, Issue 1, Moscow, Jan-Feb 1952, pp 121-132. Unclassified.

Photo - Disappearance of Pests

Cell ridge on blue shorts. See log. no. 3, '52.

Monthly List of Russian Accessions. Library of Congress. May 1952. UNCLASSIFIED.